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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,157	03/31/2004	Michael Masterov	07754.046001	8197

7590
Jeffrey S Bergman
OSHA LIANG LLP
1221 McKinney Street
Suite 2800
Houston, TX 77010

04/15/2008

EXAMINER

GREENE, DANIEL LAWSON

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3694

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/815,157	Applicant(s) MASTEROV ET AL.	
	Examiner DANIEL L. GREENE	Art Unit 3694	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-13 is/are pending in the application.
- 4a) Of the above claim(s) 10-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1, 2 and 4-13 are pending. Claims 10-13 were withdrawn from consideration on 6/7/2006. An action on the merits of claims 1, 2 and 4-9 follows.

Election/Restrictions

2. This application contains claims 10-13 drawn to an invention nonelected with traverse in the reply filed on 3/13/2006. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Response to Arguments

3. Applicant's arguments filed 1/2/2008, with respect to the rejection(s) of claim(s) 1,2,4,6 and 8 set forth in sections 8-12 of the previous Office action mailed 9/10/2007 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Ellis, Yanaki and Ericson et al.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1, 2, 4-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ellis (3,873,840) in view of either Yanaki (4,763,343) or Ericson et al. (5,327,029).

Regarding claim 1, Ellis clearly discloses a method for measuring high-energy radiation flux (abstract), comprising:

applying a voltage pulse (see, for example, Col. 1 lines 10-44, "pulse mode") for a predetermined time between electrodes in an ion chamber, wherein the ion chamber is filled with a gas capable of forming charged ions by high-energy radiation;

measuring an ion current signal related to ion currents induced by the voltage pulse while the voltage pulse is being applied to the electrodes (see, for example, col. 4 lines 54-60); and

outputting the result of the magnitude of the high-energy radiation flux (see, for example, claim 1, Col. 30 line 55 through Col. 31 line 8).

Ellis (patented 3/25/1975) teaches that it is old and well known (2008 – 1975 = 33 years) to subtract one signal from another in order to arrive at the underlying desired signal in, for example, Col. 5. It is considered that Ellis inherently measures and removes the leakage current because he is subtracting the gamma signal from the neutron signal. since both signals contain a leakage current then Ellis is inherently subtracting said leakage current as well.

However, if applicant is of the opinion that Ellis does not explicitly disclose measuring a leakage current signal after the voltage pulse has been turned off,

after ion transport has stopped, and after measuring the ion current signal and determining a magnitude of the high-energy radiation flux dependent on the ion current signal and the leakage current signal after measuring the leakage current signal, then either Yanaki (see, for example, Col. 13 lines 41-65) or Ericson et al. (Col. 5 lines 48-50) can be relied upon to show that the subtraction of leakage currents is required to provide an accurate reading. That is, both Ericson et al. and Yanaki discuss "leakage current" and the subtraction of the leakage current from the sensor signal to ensure that only the incident radiation is being measured. Note that Yanaki discloses that the subtraction of the leakage current is constantly provided with an R-C network that removes noise and leakage current.

At the time of the invention it would have been obvious to one of ordinary skill in the art to measure the leakage current AFTER the voltage pulse has been turned off, after ion transport has stopped, and after measuring the ion current signal and to determine the magnitude of the high-energy radiation flux dependent on the ion current signal and the leakage current signal after measuring the leakage current signal for the benefit of providing an accurate measurement because "All leakage currents at the input node add to or subtract from the input signal, directly contributing an input error". (Ericson et al. Col. 5 line 48-50.)

Regarding claim 2 and the limitation wherein the determining the magnitude of the high-energy radiation flux comprises subtracting the leakage

current signal from the ion current signal, again, Ericson et al. clearly discloses that leakage current must be removed to prevent input error.

Claim 4, i.e. the limitation “determining a gain of an amplifier of the ion current signal and the leakage current signal” is inherently performed by Ellis because if the gain were not determined then the detector would never provide a useable output. That is, that the detector would provide no output without an amplifier gain and would therefor be useless.

Regarding claims 5 and 9 and the limitation wherein the determining the gain of the amplifier comprises applying a ramping voltage between the electrodes in the ion chamber, Ellis inherently performs this step because a pulse is a ramped voltage. That is, a “pulse” inherently includes a “ramp” because it is impossible to prevent said pulse from initially starting as a ramping voltage. That is, there will inherently be some sort (no matter how small) of ramping voltage at the beginning and end of the pulse as it is impossible to prevent such from naturally occurring due to resistance, inductances and capacitances inherently in electrical circuitry.

Claim 6 and the limitation wherein one of a magnitude of the ion current signal and a magnitude of the leakage current signal is adjusted dependent on the gain of the amplifier is inherently disclosed because the readout of the detector is dependent on the gain of the amplifier and therefore in order to remove the input error, i.e. leakage current the signal must be adjusted according to the gain of the amplifier. That is, the actual amount of the leakage current

must be removed according to the gain of the amplifier otherwise the improper amount of leakage current will be removed.

Regarding claim 7 and the limitation wherein the subtracting the leakage current signal from the ion current signal is dependent on one of a magnitude-adjusted ion current signal and a magnitude-adjusted leakage current signal, again, leakage current is inherent to systems of this kind. It must be removed in order to provide an accurate signal. If the gain of an amplifier is adjusted, then its signal to noise ratio (comparable to leakage current) will be affected and must be accounted for and removed.

Regarding claim 8 and the limitation further comprising determining a gain of an amplifier of the ion current signal and the leakage current signal, wherein the magnitude of the high-energy radiation flux is proportional to the ion current signal and the gain of the amplifier, it must be appreciated that the limitation “determining a gain of an amplifier” reads on “displaying the output of the detector” because the gain of the amplifier is what drives the meter. That is, the gain of the amplifier produces a signal that is displayed by the detector output. That displayed output is proportional to the flux incident upon the detector because this is what the system was designed for, i.e. displaying the strength of a flux.

6. Claims 1, 2, and 4-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ellis in view of either Yanaki or Ericson et al. as applied to

claims 1,2 and 4-9 above and further in view of any of Frommer, Experiment 2-8, or Spanswick.

Ellis as modified above discloses applicant's invention as explained above.

If applicant is of the opinion that Ellis does not disclose zeroing out the detector before, during or after taking measurements then resort may be had to any of Frommer, Experiment 2-8, or Spanswick to show it is old and well known to zero out a detector in order to negate the effects of current leakage in said detectors.

At the time of the invention it would have been obvious to one of ordinary skill in the art to zero out the detector of Ellis as modified as taught to be old and advantageous by any of Frommer, Experiment 2-8, or Spanswick for the benefit of at least providing an accurate reading of the measurement to be taken.

It is considered obvious to zero out the detector at ANY POINT in order to ensure the reading is accurate. Further it is considered obvious that one would want to zero out the detector AFTER the measurement for the benefit of compensating for any drift that occurred since the last time the detector was zeroed out.

7. Claims 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ellis in view of either Yanaki or Ericson et al. as applied to claims 1, 2, and 4-9 above, and further in view of More (US Patent # 6,889,152).

Ellis as modified discloses applicant's invention as explained above.

If applicant is of the opinion that Ellis as modified does not disclose a ramping current or voltage applied to the electrodes to determine a gain then resort may be had to More to show such is an obvious and desirable thing to do.

More teaches a method for compensating circuits in high-resolution measurements. It is noted that while the embodiments disclosed in More deal with "temperature" measurements, these embodiments are only exemplary. The teachings of More would apply to any high sensitivity voltage measuring circuit (column 1, lines 25-36). Specifically **More teaches the importance of accounting for changes in amplifier gain in a voltage detection circuit. (Known in the nuclear art as "drift") By applying known inputs to the amplifier, the gain of the amplifier can be ascertained and thus corrected for (column 67, lines 10-21).** The ramping voltage would be an obvious variant of a series of known inputs.

Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to apply a ramping voltage to the two electrodes to determine the amplifier gain so as account for gain variations over time, thereby allowing correction of the detected signal for high sensitivity measurements, as taught by More.

leakage can be defined as

Physics, Electricity. the loss of all or part of a useful agent, as of the electric current that flows through an insulator (leakage current) or of the magnetic flux that passes outside useful flux circuits (leakage flux).

Drift is defined as

Electronics.

- a. a gradual change in some operating characteristic of a circuit, tube, or other electronic device, either during a brief period as an effect of warming up or during a long period as an effect of continued use.
- b. the movement of charge carriers in a semiconductor due to the influence of an applied voltage.

8. Claims 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ellis in view of either Yanaki or Ericson et al. and further in view of any of Frommer, Experiment 2-8, or Spanswick as applied to claims 1, 2, and 4-9 above, and further in view of More (US Patent # 6,889,152).

Ellis as modified above discloses applicant's invention as explained above. If applicant is of the opinion that Ellis as modified does not disclose a ramping current or voltage applied to the electrodes to determine a gain then resort may be had to More.

More teaches a method for compensating circuits in high-resolution measurements. It is noted that while the embodiments disclosed in More deal with temperature measurements, these embodiments are only exemplary. The teachings of More would apply to any high sensitivity voltage measuring circuit (column 1, lines 25-36). Specifically More teaches the importance of accounting for changes in amplifier gain in a voltage detection circuit. By applying known inputs to the amplifier, the gain of the amplifier can be ascertained and thus corrected for (column 67, lines 10-21). The ramping voltage would be an obvious variant of a series of known inputs.

Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to apply a ramping voltage to the two electrodes to determine the amplifier gain so as account for gain variations over time, thereby allowing correction of the detected signal for high sensitivity measurements, as taught by More.

Conclusion

9. Applicant's invention is directed towards removing leakage current from a radiation detector and correcting for the drift in the electronics in the circuitry. Both situations, i.e. leakage currents and electronic drift are notoriously old and well known as evidenced by the references made of record.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL L. GREENE whose telephone number is (571)272-6876. The examiner can normally be reached on Mon-Thur.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James P. Trammell can be reached on (571) 272-6712. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. L. G./
Examiner, Art Unit 3694
2008-04-14

/Mary Cheung/
Primary Examiner, Art Unit 3694